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Adoptive behaviour in Fallow deer (*Cervus dama*)

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In the Cervidae, occasional adoptive behaviour has been described (e.g. Altmann 1963; Woodson et al. 1980) and recently, Birgersson et al. (1991) have furnished new information about allosuckling in an enclosed population of *Cervus dama*.

During the fawning season (25 May–15 June of 1991) we observed a wild fallow deer population in Doñana National Park (SW Spain). The 20 known females present in the area were monitored with a telescope from a 30 m high tower to determine the birth date and to capture their newborn fawns.

On the 2nd of June at 10:05 h two new born fawns (female and male) were captured, sized and marked (in about 15 min) in nearby sites (approximately 100 m). Both fawns (the male being born 6 h later) weighed 5100 g. Their weights are included in the rank of those recorded for the rest of newborn fawns captured in the same area ($\overline{X}$ = 5014.6 g, SD = ±438.3 g, n = 24). On the 3rd of June the mother of the female fawn adopted the male once after this fawn was rejected by its own mother. Both fawns have been observed alive after 6 months.

The duration of suckling bout periods during the early isolation period (first 10 days of life, San José and Braza 1992) were recorded for the "twin" fawns and for the rest of marked fawns (four males and six females) in the study area in order to compare suckling behaviour of "twins" with single fawns. Two consecutive suckling bouts were considered distinct when separated by more than 5 min. Suckles lasting 5 sec or less were considered suckling attempts. The Table represents the results of the analysis. Significant differences between "twins" and single fawns were detected during the isolated period, mainly due to differences in the first five days of life. No differences between sexes were detected during this period either in "twins" or in single fawns (t-test). Some studies found that each twin sucks as often as any single fawn, the milk production rates being higher in does with twin fawns (Sadleir 1980; Gauthier and Barrette 1985).

Mean duration of suckling bouts (sec.)

Age	"Twins"			Singles			t-test		
(days)	n	$\overline{X}$	SD	n	$\overline{X}$	SD	t	df	p
1–5	29	231.7	183.7	28	91.1	50.8	3.9	55	0.0003
6–11	16	123.3	95.5	9	77.4	46.7	1.3	23	NS
1–11	45	193.2	165.3	37	87.7	49.5	3.7	80	0.0003

n = number of suckling bouts recorded, $\overline{X}$ = mean, SD = standard deviation, t = value of the Student statistic, df = degrees free, p = probability, NS = not significant.

Several hypotheses have been developed regarding possible selective benefits and environmental constraints associated with alloparental care and adoption (Riedman 1982). Some of the circumstances considered in these hypotheses are present in our study population: groups of fallow deer females are constituted by members related by matrilineal descent (San José 1988) and present an extraordinary attachment to particular areas (San José and Braza 1991). A high degree of inbreeding is taking place, and a monomorphism of focused haemoglobin has been detected in the Doñana fallow deer population (Schreiber et al. 1992). In this case, fostering behaviour could have arisen by means of kin selection (Riedman 1982). However, the case of adoption observed in our study population may also be attributed to a reproductive error on the part of the foster mother as occurs in many mammals, (revision of cases in Riedman 1982). It is also interesting that last year the mother of the female fawn lost its fawn after this was marked. This female is seven years old and has given birth during the last six years. The fact that it didn't rear any fawn last year, together with the good environmental conditions in spring 1991 perhaps contributed to a particularly good physical condition of this female this year.

Although this report represents only an isolated case, it reveals that extra maternal investment is possible in fallow deer. This doesn't follow the hypotheses recently posed by Byers and Moodie (1990) which predicts that the level of resources that mothers must provide to support high postnatal growth rates (as in the case of ungulates) precludes any extra investment in individual sons. We think that if it is possible for a mother to make an extra investment to rear a strange male fawn, a margin probably exists in the amount of partental investment allocated by a mother to her fawn depending on different factors such as the sex of the fawn or its own physical condition. Since the food requirements could play an important role, in captivity they can cause conditions favourable for alloparental suckling behaviour to take place as has been observed by Birgersson et al. (1991).

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